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Short Title: Evaluation of an organizational-level SMI

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Abstract

This field study evaluates the process and outcome of an organizational-level stress management intervention (SMI) in eight companies, taking into account the lessons learned from previous evaluation research. It utilizes the RE-AIM evaluation framework to capture the **R**each and **A**doption of the intervention in the companies, the appraisal of the **I**mplementation process and the project's **E**ffectiveness and **M**aintenance with a range of qualitative and quantitative methods. It applies an adapted research design in the context of a field study involving entire organizations, retrospectively assigning study participants to comparison groups. The results of a longitudinal analysis (n=1,400) showed that the SMI had a positive impact on the participants' job demands and resources, when controlled for baseline levels. Qualitative data analysis revealed that the companies had built capacities for on-going health promotion and showed what issues must be borne in mind when implementing such projects. The study also showed that participation in such interventions alone does not suffice to achieve the desired impact, but that the individual participants' appraisal of the intervention and the collective involvement of the teams must be further researched to fully understand how change occurs.

Keywords: Evaluation, health promotion programs, occupational stress, organizational change

Introduction

A stressful working environment has been acknowledged as an emergent health issue (European Agency for Safety and Health at Work, 2010). Much evidence has been accumulated on the link between adverse psychosocial working conditions and a number of health and business outcomes (Bond et al., 2006), calling for stress management interventions (SMI). To be effective, SMI should target both *individual and organizational levels*, considering the needs and capacities of both employees and the organization (Nielsen et al., 2010). Expanding SMI to the organizational level represents an advance from single-measure interventions to a dynamic process of organizational change, ultimately enabling companies to manage health themselves. Further, the exclusive focus on stressors has been expanded, including job resources as a factor that mitigates the pathogenic effects of stressors while unfolding a distinct motivational potential (Bauer and Jenny, 2012). Simultaneously, such SMI are not limited to employees with a high risk of disease and long-term sickness for whom intensive and behavior-tailored programs are derived. They target the overall working population with an average health distribution, aiming to preserve and enhance their health status. In this context, SMI follow a salutogenic approach aiming at strengthening resources and slowly but steadily building a sustainable health-promoting working environment. The literature on the *effectiveness* of SMI shows that employees benefit from individual-level SMI (Richardson and Rothstein, 2008). However, there is still a lack of studies evaluating the effects of organizational-level interventions and the results of the few existing ones vary (LaMontagne et al., 2007). A systematic review by Bambra et al. (2007) found that some of the participatory organizational-level interventions improved employee health problems such as general complaints, emotional exhaustion and musculoskeletal disorders by increasing job control. Bond et al. (2006) also found significant effects of organizational-level interventions on business outcomes (i.e. decreased absenteeism, lower staff turnover, better objective and subjective

performance ratings). In sum, organizational level interventions have the potential to produce positive effects, but they appear to show diverse and partially contradicting results in terms of the combination of intervention elements and effect magnitudes over a range of outcomes. This is attributed to the heterogeneity of the studies in terms of sample sizes, time lags, intervention components, effect measures, study context, etc. (cf. Biron et al., 2012). Further, the *dynamics of change* in organizations limit the ecological validity of predefined interventions implemented under controlled conditions in pre-assigned intervention and control groups. Moreover, such research is often limited to short follow-up periods such as 3-12 months (Zapf, Doorman & Frese, 1996), leaving long-term effects as well as the routinization of the interventions unnoticed (cf. Taris & Kompier, 2003). As SMI are interventions into complex social systems, Kompier and Kristensen (2000) acknowledge that most SMI studies require non-traditional research designs. Semmer (2006) argues in favor of changing the focus from outcome variables to work characteristics as determinants of health and well-being, and notes that more detailed analyses and documentation of context and process factors influencing intervention success are needed, rather than simply criticizing (supposedly) poor designs. This view is also echoed and advanced by Nielsen and Randall (2012), who include information on the intervention process as a relevant moderating variable explaining the variance in the effectiveness of the intervention. Randall et al. (2005) argued that measurement of the intervention process can be used to adapt and shape the design of the effectiveness evaluation: Intervention exposure and appraisal serve to retrospectively assign employees to intervention and control groups and thus support quantitative outcome evaluations where controlled quasi-experimentation is not possible (Randall et al., 2005). If such “less-than-optimal” designs are applied, strong theoretical intervention evaluation frameworks (Chen, 1990) and mixed methods (Leech and Onwuegbuzie, 2009) should be used to capture the intervention context and

process in order to plausibly attribute observed effects to the implemented intervention and cross-validate the results.

Aim and scope of the present study

The main purpose of the present study is to evaluate the process and outcome of an organizational-level SMI in the field, consisting of several intervention elements and involving entire companies. Building on the lessons learned from previous research as described above, this study captures the *process of implementation* with both *qualitative and quantitative* methods, includes *both job demands and resources* as *proximate outcomes*, and utilizes the criteria of the well-established RE-AIM *evaluation framework* (Glasgow et al., 2003). This framework emphasizes not only the effectiveness and maintenance of intervention projects, but also their reach, adoption and implementation quality. Further, this study applies an *adapted research design*, retrospectively assigning study participants to comparison groups (Randall et al., 2005). The research questions addressed by this study are as follows (see Fig. 1): 1) To what extent were the single intervention elements adopted by the company units? To what extent were the company employees reached? 2) Were the single intervention elements appraised favorably by the participants? How are the different facets of the appraisal related to each other (i.e. outcome expectancies, coherence, company fit, and voluntariness of participation)? 3) Was the overall intervention assessed favorably in retrospect? Does this retrospective impact assessment relate to longitudinal changes in job resources and demands? 4) To what extent is the retrospective impact assessment related to the reach within company units? 5) What factors facilitated or hindered the overall implementation process, and was maintenance of the SMI assured?

Method

Implementation of the SMI

The SMI was implemented in eight medium-sized and large companies in diverse sectors (industrial production companies, a food processing company, a public administration service, and hospitals) and two language regions of Switzerland from 2008 to 2010. The company employee numbers in the year 2008 ranged from 323 to 1,050 (M = 589). These companies responded to a broad project call by the initiators and funding body (see acknowledgements) and committed themselves to the program. Figure 1 illustrates the implementation steps covering a period of three years. The program started with a kick-off meeting with top management, ensuring backup from the top decision-makers. Internal project leaders were appointed and a steering group was established, designed to bring in the employees' perspective and support the implementation of the program. A baseline employee survey was conducted in mid-2008, followed by an intermediate survey in 2009 (not shown in Fig. 1) and a final survey at the end of 2010. Results were immediately and automatically fed back to individual participants in the form of a "traffic-light" display and detailed percentile ranks with regard to benchmark values, including tips on the highlighted topic. One-day courses plus a half-day refresher course approximately six months later were provided by external consultants, targeting (1) employees, (2) managers, and (3) teams. (1) *Employee-level stress management courses* conveyed basic knowledge and training on stress, stress appraisal, coping strategies and cognitive restructuring, building up motivation and planning the transfer to daily work life. These courses built on scientific evidence as well as practitioner manuals (Kaluza, 2004). (2) *Managerial-level courses on health-promoting leadership* showed how to integrate a health perspective into everyday leadership routines. Participants learnt how to recognize psychosocial health issues at work, receiving information and being trained in groups on the handling and reflection of their survey results. They then developed concrete steps and deepened their knowledge on a particular issue, such as teamwork, communication and information

skills, feedback, work design (focusing on participation and resources), social support, delegation of tasks, and/or change. (3) *Team-level working groups (health circles / team reflections)* were designed as workshops for teams to address their job demands, resources and potential individual- and organizational-level solutions, building on participatory reflection, discourse and group work (Schröer and Sochert, 2000). During the intervention period, regular communication measures were applied and information events held on the progress of the project as well as on topics such as work-life balance. Participants took part in the intervention during working hours. Participation in employee-level courses was mandatory for those teams with high levels of job demands. The companies also obliged their managers to participate in managerial-level courses (the hierarchical level defined by the companies themselves). Since the baseline and follow-up analyses in the companies were more intensive and thus costly in this intervention study than in case of routine SMI, the companies received them at no charge. However, to assure their commitment to the intervention, the companies had to pay for all courses and workshops.

[Figure 1 about here]

Evaluation research design

The present study utilized the criteria of the RE-AIM evaluation framework (for detailed information see Glasgow et al., 2003). These criteria were originally developed to evaluate the public health impact of health-promoting interventions and have found widespread application in these communities, as documented on www.re-aim.org: **R**each captures the rate of participation and representativeness of participants, **E**ffectiveness measures the desired changes in indicators and consistency of changes, **A**doption captures the proportion and representativeness of the participating companies or units, **I**mplementation assesses the extent to

which interventions were delivered as intended, and **M**aintenance assesses the extent to which the interventions are sustained in enterprises and individuals. Figure 1 illustrates the evaluation design in line with the implementation steps. Following a mixed-methods approach (Leech and Onwuegbuzie 2009), qualitative and quantitative measurements were applied to capture the effectiveness of the project as well as the overall implementation process and the implementation of single intervention elements. With regard to the effectiveness outcome, the main focus was placed on work characteristics as determinants of health and the proximate target of the SMI, as suggested by Semmer (2006; see also Bauer & Jenny, 2012). For this purpose, a job resources/demands-ratio (R/D-ratio) was computed, i.e. an integrated measure dividing job resources by job demands reflecting the synergetic effects of positive and negative aspects of the job (cf. Schaufeli et al., 2009): Two standardized factor scores of job demands and resources were computed using a regression-based method and transformation to positive values. The factors were derived from S-Tool measures (see below for details), which were selected and tested for company invariance, i.e. their factorial structure and correlation with health outcomes were similar for all companies (Brauchli et al., 2013; Brauchli et al., manuscript submitted). Regression-to-the-mean phenomena and differential effects attributable to a variance in baseline levels (Flaxman and Bond, 2010) were accounted for by separately studying effects in subgroups and controlling for baseline levels.

Data sources

A key instrument for quantitative data collection was a newly developed online employee survey called S-Tool completed by participants at three measurement points. S-Tool was developed by the University of Berne (Chair N. Semmer) and consists of scientifically reliable and valid scales measuring job demands, resources, well-being and health (for in-depth details on the selected scales utilized, see Brauchli et al., 2013, Brauchli et al., manuscript submitted).

Short evaluation questionnaires were distributed at refresher sessions of the employee- and managerial-level courses. These questionnaires were discussed with fellow researchers and the external consultants during experience-exchange groups and were pre-tested with a convenience sample of 15 employees for comprehensibility, content validity and relevance of the items. Qualitative data was collected via structured face-to-face interviews with key persons (led by the consultants), telephone interviews with line managers and group discussions with the steering group members (both led by the evaluation researchers) at the beginning and end of the project.

Sample

Eight companies comprising a total of 58 units participated in the study. The company units were made up of self-defined subsystems within the companies, i.e. clusters of teams departmentalized according to the respective organizational charts. The baseline employee survey carried out in 2008 yielded a sample of 3,532 participants (response rate: 71%). Follow-up surveys in 2009 (n = 3,193; 63%) and 2010 (n = 2,496; 50%) yielded fewer participants. The panel of employees who took part in both the baseline and final surveys (n = 1,530) consisted of 520 women (34.0%) and 1,010 men (66.0%), with an average baseline age of 39.6 years (SD = 10.5). Of these, 51.7% had a higher education (college or university), 33.1% held a leadership function and mean organizational tenure was 9.6 years (SD = 9.3). Logistic regression analyses were applied to test whether participation in the final survey was predicted by demographic and study variables, assessed at the baseline. The results showed that men (OR = .74, $p < .001$) and participants with a leadership function (OR = .65, $p < .001$) had a lower drop-out rate. Additionally, participants with better job resources (OR = .79, $p < .001$) remained longer on the panel. It can therefore be concluded that attrition does not constitute a severe problem, although there is a minor selective drop-out rate with respect to gender, man-

agerial position and job resources. The qualitative data is based on a sample of 5-20 key persons in each company for structured face-to-face interviews, 5-10 group discussion members and 5-8 line managers in each company for structured telephone interviews. The interview partners were selected by the consultants and the internal project leaders, who consisted of employees with a leading function from each company unit. Group discussion members consisted of the members of the steering group, acting as a "sounding board" for employee perspectives and the implementation process.

Measures

Research question 1: To assess both adoption and reach, participation rates were calculated by using self-reports in the intermediate and final employee survey, and participation lists were distributed during employee- and managerial-level courses as well as team-level working groups. The calculation was based on average company sizes from 2008 to 2010, since company size and structure varied over time. *Research question 2:* To evaluate the implementation of the single intervention elements, participants of employee and managerial level courses rated a) their outcome expectancies with two items on the anticipated impact of the course on the company and themselves, b) the course's coherence with three items on its comprehensibility, manageability and meaningfulness, and c) its company fit with two items on perceived company investment in health promotion and culture on a seven-point Likert-scale. Additionally, a single item on the voluntariness of participation was assessed ("yes, more or less, no"). *Research question 3:* In the final employee survey, a five-item scale with good internal consistency (Cronbach's $\alpha = .88$) was included, retrospectively assessing the impact of the overall intervention with its combined intervention elements, irrespective of individual participation in courses (Fridrich et al., 2013, Fridrich et al., manuscript in preparation; see also Randall et al., 2005, Nielsen & Randall, 2012). The scale was introduced by

giving a short reminder of the project and its activities (see Figure 3 for items). Retrospective impact assessment was linked to the R/D ratio as the proximate effectiveness outcome. Job resources were covered by the following scales: Supportive leadership (Udris and Rimann, 1999; 5 items, α = .82), interpersonal fairness of managers (Colquitt, 2001; 4 items, α = .81), manager and peer support (Frese, 1989; 2 single items), manager and peer appreciation (Jacobshagen et al., 2005; 2 single items), task identity (Udris and Rimann, 1999; single item), and job control (Semmer et al., 1995; 6 items, α = .87). Job demands were covered by the following scales: Time pressure and work interruption (Semmer et al., 1995; both 4 items, α = .83), qualitative overload (Udris and Rimann, 1999; 3 items, α = .78), and uncertainty at work (Semmer et al., 1995; 4 items, α = .75). *Research question 4:* To analyze the relationship between the retrospective impact assessment and the reach within company units, mean levels of individual retrospective impact assessment were computed for each unit. *Research question 5:* To evaluate the overall implementation and maintenance, ten factors of successful change processes (Gerkhardt and Frey, 2006) were used to structure the qualitative data collection. Gerkhardt and Frey (2006) conducted a review of several studies on relevant factors of change processes, such as that of Kotter (1995), deriving a set of success factors of change processes in organizations. These factors were used to systematically condense the qualitative data broadly assessed with open questions on, a) the implementation *context,* i.e. individual and organizational resources, readiness for change, attitudes towards stress and health promotion, similar parallel activities in the companies, etc., b) the implementation *process,* i.e. communication, cooperation, participation, measures developed, leadership involvement, etc., and c), the *outcomes,* i.e. change in job resources and demands including leadership behavior as well as awareness of stress and coping with it. The consultants who conducted the interviews were equipped and trained with the same interview materials and guidelines. Maintenance was qualitatively evaluated as a change in organizational capacities for health promo-

tion, i.e. structural, strategic and cultural facets of the organization that support both salutogenic working processes and targeted health-promoting activities.

Data analysis

Characteristics of (non-)participants with respect to demographic and study variables were tested via t-/chi-square analyses. Outcome expectancies were analyzed in relation to the course coherence, fit and the voluntariness of participation. Retrospective impact assessment was split into two groups based on a mid-scale cut-off value, i.e. low/medium impact vs. high impact, and used as a grouping variable for the longitudinal analysis of changes in the R/D ratio (repeated General Linear Model). To account for regression-to-the-mean phenomena and differential effects attributable to baseline values, the analysis was separately carried out for groups with unfavorable, favorable and very favorable R/D ratios at the baseline measurement. Further, as described above, mean values of retrospective impact assessment were computed on a unit level to compare subgroups of units with high (+1 SD) and low (-1 SD) impact assessments with regard to the reach of intervention elements in their units. All quantitative analyses were performed with SPSS 19. The qualitative analysis of the overall implementation process collected in the face-to-face and telephone interviews as well as the group discussions was systematically aggregated on the basis of factors of successful change processes derived by Gerkhardt and Frey (2006), as mentioned above. Priority was given to the qualitative data collected by the evaluators and this was cross-checked against the data collected by the consultants. The changes in organizational capacities for health promotion with regard to project maintenance are described in qualitative terms.

Results

(1) Adoption by units and individual reach of single intervention elements: 56 of the 58 company units adopted at least one of the intervention elements. 84% of the units adopted employee-level courses, 95% managerial-level courses, and 91% team-level working groups. Individual reach (average of company means) was 19% for employee-level courses, 88% for managerial-level courses and 34% for team-level working groups. Moreover, 16% attended supplemental information events, while 20% and 9% respectively took part in additional training or private courses. In regard to representativeness, participants in the employee-level courses had notably higher demands at baseline, $t(1298) = -3.68$, $p < .001$, compared to the non-participants. This can be explained partly by the selection of participants on the basis of an unfavorable job resources/demands profile of the corresponding teams. Participants in managerial-level courses did not differ from non-participating managers in regard to job demands and resources. This can again be explained partly by the obligation to attend these courses, and thus by the high participation rate. However, participating managers had higher job tenure, $t(566) = -4.11$, $p < .001$, and were older, $t(570) = -5.74$, $p < .001$, than non-participants. Small differences were also seen for team-level working groups, where the participants only had a higher level of education, $\chi^2(4) = 84.28$, $p < .001$, compared to non-participants. Participation rates in the employee surveys, which are considered as an important project element relevant to change (Inauen et al. 2011), are described in the sample section. They showed high reach at the beginning (71%), however decreasing to 50% at the end of the project.

(2) Appraisal of courses and relationship with facets of appraisal: Coherence of both employee- and managerial-level courses were rated high (M=6.12/6.11, SD=0.84/0.76, n=506/366). Company fit was rated lower with M=5.29/5.30 (SD=1.13/1.25, n=444/354) and outcome expectancies with M=4.91/4.92 (SD=1.12/1.04, n=499/373). 33% of participants in

employee-level courses (n=505) and 48.1% of participants in managerial-level courses (n=368) indicated voluntary participation. Comparisons of groups of employees with low vs. high outcome expectancies (tertiles) indicated that for employee-level courses, 82% of the participants with low ratings participated (more or less) involuntarily in the workshop, compared to 48% in the group with high ratings, $\chi^2(2) = 59.57$, $p < .001$. This pattern could also be seen for managerial-level courses, $\chi^2(2) = 8.16$, $p = < .05$. In both employee- and managerial-level courses, the two groups with low and high outcome expectancies also differed in their ratings of company fit, $t(313) = -5.34$, $p < .001$, and $t(237) = -6.94$, $p < .001$ respectively, and coherence of courses, $t(358) = -8.37$, $p < .001$, and $t(249) = -6.59$, $p < .001$ respectively. This means, that participants with high outcome expectancies also perceived a better company fit of measures, as well as a higher coherence of course contents.

(3) Retrospective impact assessment and related longitudinal changes in the R/D-ratio: In the total panel sample (n=1,400), 24.9% of the respondents (average of company means) attributed a high impact to the overall intervention with its combined intervention elements. Related longitudinal changes in the R/D-ratio for employees and managers were split according to their initial R/D-ratio, resulting in 6 panels as displayed in figure 2. Over the course of time, both employees and managers with an unfavorable baseline R/D-ratio (Panels 3 and 6 in Figure 2) attributing a high impact to the project at follow-up improved their situation to a favorable R/D-ratio compared to the low/medium impact group, with $F(1, 239) = 12.49$, $p < .001$, for employees and $F(1, 143) = 12.62$, $p = .001$, for managers. Those with a favorable baseline R/D-ratio (Panels 2 and 5 in Figure 2) attributing a high impact to the project at follow-up also showed an improvement in their R/D ratio, for employees $F(1, 206) = 5.71$, $p = .018$, and managers $F(1, 115) = 3.49$, $p = .064$. Those with a very favorable baseline R/D-ratio (Panels 1 and 4 in Figure 2) attributing a high impact to the project at follow-up could

maintain their situation in regard to the R/D-ratio, whereas it deteriorated for the comparison group that attributed a low/medium impact to the project, for employees $F(1, 319) = 8.96$, $p = .003$, and managers $F(1, 162) = 0.71$, $p = .400$ respectively. From this, one can conclude that consistent improvement or maintenance in the R/D-ratio may be observed over a two-year period for those who retrospectively attributed a high impact to the project at the final follow-up survey, with the exception of managers with a very favorable R/D-ratio.

[Figure 2 about here]

(4) Relation of reach within units to mean levels of retrospective impact assessment: Company units with a high mean level of retrospective impact assessment (+1 *SD*, $n = 10$) compared to units with a low mean level (-1 *SD*, $n = 11$) differed significantly in their reach of intervention elements (see Figure 3): units with a high mean level revealed four times higher reach (78% vs. 18%) of team-level working groups, $t(19) = 5.60$, $p < .001$, three times higher reach (32% vs. 11%) of employee-level courses, $t(19) = 3.19$, $p = .005$, two times higher reach (25% vs. 12%) of presentations, $t(19) = 1.71$, $p = .104$, but no differences in reach of managerial-level courses and private or other courses.

[Figure 3 about here]

(5) Assessment of the overall implementation and maintenance: The following issues emerged as relevant for the majority of the companies from the qualitative data collected through the interviews and group discussions (structured according to Gerkhardt and Frey, 2006; see methods). ***(Factor 1) Comprehensive diagnosis:*** The employee survey dominated perceptions of the project to a great extent, generating visibility in regard to job demands and

resources. Automated feedback and personal tips were appreciated, stimulating discussion and change, especially at the beginning of the project. The participants saw it as a sign of respect that they were asked to express their views and opinions. However, especially with managers, the survey also raised fears and discomfort, as poor – or even excessively good – results of their respective teams could potentially lead to sanctions or stigmatization. Lastly, it proved difficult to interpret changes in the results of the three survey waves without the help of the consultants and qualitative information on the overall organizational dynamics. ***(Factor 2) Definition of goals/vision:*** The project was considered a long-term investment with initially broad goals, although some of the companies already had specific health management policies and actions in place. Employee expectations were relatively vague, to some extent raising expectations which could not be met and thus leading to perceptions that the effort involved was too high. ***(Factor 3) Shared problem awareness:*** The importance of health and stress to organizations was largely recognized – also with regard to older workers – and awareness of manager behavior and health was particularly raised and firmly established. However, there was no general consensus on the priority of this issue: thus hospital physicians showed little interest in the subject, and in production units ergonomics and safety was viewed by some as being more important than stress. Conflicts arose where employees were laid off, job insecurity was at its height, and more work was demanded with fewer resources, so that the stress management project was dismissed as a farce or marketing exercise. ***(Factor 4) Guiding coalition and drivers:*** The majority of companies showed strong commitment by their senior management and firm anchoring of the project. In some companies, implementation was disrupted by changes at executive level, and especially in internal project management, which was a critical driving force. In any case, managers played a central role in the project: Where managers faced up to the results (even critical ones), engaged in dialogue and pursued changes with their team while receiving support and direction from their superiors, the process

could unfold. The steering group could facilitate this process if it was well-anchored in the company, had the necessary resources and autonomy, and consisted of people with influence and credibility. ***(Factor 5) Communication**:* Primarily, existing communication channels were utilized to draw attention to the project. As communication was especially intense prior to the employee surveys, the project tended to be particularly associated with this broad survey. When electronic media was used, there was a risk that information would be lost in the flood of e-mails. Due to company-specific adaptations to the project as well as parallel change projects, the SMI did not have a distinctive, recognizable profile in all companies. ***(Factor 6) Time management:*** Employees reacted sensitively to delays between the employee survey and subsequent action. The survey results also lost significance rapidly in companies that were simultaneously undergoing extensive restructuring. ***(Factor 7) Project organization and responsibilities:*** The steering group enabled employees to contribute opinions and ideas from different company sites and units as well as to provide frank feedback. Coordination of project activities required considerable effort by internal project management and collaboration with other stakeholders such as Human Resources, Health & Safety, etc. As expected, high time pressures led to requests to reduce the length of courses, a low problem awareness led to a refusal to participate, and a shortage of funds led to cancellation of courses. Depending on company culture and the type of issues to be discussed, bringing people together at one table helped to build bridges between rival departments. ***(Factor 8) Providing resources and helping people to help themselves:*** Existing structures were used and working time was made available by management. Because managers in some companies were obliged to report on their team's results, they were forced to engage personally with the vocabulary and interpretation, rather than having this done for them by consultants. Finally, the project offered all employees who completed the survey an opportunity for self-reflection with the aid of tips and benchmarks. ***(Factor 9) Quick wins and motivation:*** Various incentives and giveaways such

as mugs with the project logo were provided to motivate employees to participate in the employee surveys. However, it was argued that too little was done for those with good results, i.e. in the form of advice about how to maintain their situation. ***(Factor 10) Process flexibility:*** The opportunity to adapt the implementation process to the company was welcomed. Even so, the project was sometimes felt to be insufficiently flexible, the hospitals in particular would have liked more specific solutions to their working environment. Likewise, all-day courses were perceived as too long for the production units, and special solutions had to be developed for field services. ***Maintenance:*** The project raised awareness in all branches, and especially in the industrial sector, of the links between psychosocial working conditions and health, and in particular of the impact of manager behavior on employee health, recognizing the strategic importance of the subject. For example, management forums were established where younger and older managers could interact, leadership issues were systematically developed, managers took part in retreats, and coaching services were used. Further, formal changes were made to structures: e.g. team meetings with adapted agendas evolved, work was more consciously organized and planned with respect to job demands, resources and health, roles were clarified and rules of communication were developed. Direct, smaller changes were made in infrastructure (e.g. relaxation rooms) and traditional health promoting activities (e.g. Nordic walking groups) were introduced or expanded. Among the more informal changes, greater transparency and openness were reported, influencing emotional dimensions and corporate climate – which is a precondition for talking openly about stress, burnout and psychosocial issues in general and about leadership problems – supported by team events such as after-work drinks and barbecues, regular communal lunch breaks or cross-unit events promoting mutual appreciation and collaboration. By creating positions for people in charge of health promotion issues and continuing the steering group, health circles and team reflection sessions, the project's elements were formally embedded in corporate structures. At a strategic level, the pro-

ject's elements were either embedded in related areas of responsibility (e.g. Environment, Health and Safety), or combined with other optimization processes that targeted employee commitment and productivity. The embedding process also called for ongoing monitoring and controlling: since the employee survey is a very comprehensive instrument designed for in-depth analysis conducted every 2- to 3-years, some companies introduced their own short-term "barometers" and health checks, although not always systematically. As a result, these companies developed changes in their self-observation and self-reflection processes and activities.

Discussion

The main purpose of the present study was to evaluate the process and outcome of an organizational-level SMI in the field with both qualitative and quantitative methods. It utilized the RE-AIM evaluation framework (Glasgow et al., 2003), based on a ratio of job resources and demands as the proximate outcome (R/D-ratio), and applied an adapted research design, retrospectively assigning study participants to comparison groups (Randall et al., 2005). First, the study analyzed the adoption and reach of the intervention elements. The project was designed to leave no one "untouched", and succeeded in this aim: people participated in employee-, managerial- and/or team-level courses or working groups and surveys in nearly all company units, thus guaranteeing a high adoption of the project at unit level. However, as the second research question revealed, participation in the implementation process was not enough: comprehensible and manageable courses considered to fit the corporate strategy and culture were correlated with high outcome expectations at the time of the course (cf. Nielsen & Randall, 2012). Also, voluntariness of participation correlated with high outcome expectations, raising the question of how to motivate people who needed the courses but lacked interest in them. Next, a quarter of the employees responding to the surveys retrospectively attributed a high

impact to the overall intervention (third research question), a factor consistently related to longitudinal changes in the R/D ratio controlled for initial baseline values. Furthermore, the fourth research question showed that company units with high mean levels of retrospective impact assessment also displayed a much greater reach of team-level working groups compared to units with low mean levels. This result suggests that team-level working groups are an important, if not a central, intervention element: within these working groups, teams engaged in a participatory, health-oriented problem-solving process which also builds or strengthens interpersonal relations (cf. Karanika-Murray & Biron, 2013). Thus, when researching the effectiveness of such participatory, organizational-level SMI, we have to consider that change occurs within teams and is not limited to "participants", but extends to all team members. The overall qualitative analyses of the implementation process (fifth research question) showed that successful implementation requires perseverance, strong coalitions, constant fine-tuning and support (but also obligation), as well as systematic training and reflection, until the company has established its own health-promoting routines (cf. Ipsen & Andersen, 2013). The project provided support not only for employees with a high risk of disease, but for the broader workforce, whose members already cope more or less successfully with their day-to-day work. The S-Tool survey was part of this support process: it created visibility and thus the grounds for the manageability of stress. The issues surveyed were largely perceived as legitimate and relevant to all branches (Inauen et al., 2011). In particular, the process also raised awareness for the role of job resources with regard to both stress buffering and distinct motivational potential, and the importance of strengthening and/or maintaining these resources by applying corresponding measures (cf. Salanova et al., 2012). This further raises the issue of gain and loss cycles: employees with high job resources can use them to further strengthen their health and resources, whereas those whose situation is already difficult may suffer a vicious cycle of poor health leading to poorer mobilization of resources,

in turn leading to even worse health (cf. Hakanen et al., 2008). The question also arises as to whether anyone experienced “losses” as a result of the project, for instance those who were laid off due to repeated poor results of employee surveys, were stigmatized or experienced negative team dynamics as a result of the project. There is considerable reluctance in the field of health promotion to discuss this question, as workplace health promotion is often associated with the notion of "win-win". Finally, the project was conducted at a time of unstable political and economic conditions which jeopardize the implementation of SMI. Most of the companies were coping with intensive environmental change during the time of project implementation: the industrial sector faced a global economic crisis, forcing them to restructure, lay off staff, introduce management changes and short-time work, thus inducing considerable insecurity for employees as well as the SMI project. Nevertheless, the project helped to initiate and permanently anchor health-oriented optimization processes in some corporate strategies, structures and cultures, enabling these companies to perceive and develop their health capacities.

Strengths

This study applied multiple methods and the well-established RE-AIM framework to capture and analyze both the implementation process and effectiveness of the project. In doing so, it yielded both qualitative and quantitative results relating to the dynamics of SMI projects which can be used for future project design. These plausible and consistent results generated on the levels of individuals, units and companies have high external validity, as they were generated in the field of heterogeneous companies, depicting near-to-real-life change processes implemented by consultants.

Limitations

The most obvious limitation in terms of traditional study designs is the lack of pre-assigned intervention and control groups for quantitative longitudinal analysis. This was addressed with an adapted study design and by using an evaluation framework providing consistent information from multiple sources gathered to produce an overall picture. The study's results suggest that change occurs within teams and may therefore not be limited to participants of single intervention courses. As regards this dynamic participatory change process triggered by organizational-level SMI, the roles of affective and cognitive process appraisals and outcome expectancies also need to be elaborated in greater theoretical and empirical depth, and corresponding measures need to be further developed and validated. This will help to address the problems of the invisibility of the dynamics released by a combination of intervention elements in teams and units, as the sheer impossibility of capturing these dynamics by quantitative methods remains unaddressed. Accordingly, future research will have to devise manageable approaches that link limited quantities of process data on adoption, reach and implementation directly to a longitudinal effectiveness analysis. Finally, researchers should explore how selective drop-outs impact both the change process and the study results, as we observed that men, employees with better resources and leaders dropped out less frequently from the panel.

Conclusions

The future dissemination of organizational-level SMI requires the key success factors for implementation as well as the potential impact to be studied. To utilize and understand the full dynamics of health-oriented change processes under real life conditions, we need to involve entire organizations in our research. The present study showed that such research is feasible if it builds on a clear intervention and evaluation framework which structures the collection and analysis of rich qualitative and quantitative data. With regard to the implementation process,

for example, the facets of course appraisal showed meaningful interrelations, opening possibilities for quality assurance in future implementations of organizational-level SMI. In evaluating the effectiveness, for example, the adaptive study design retrospectively split employees into two groups, depending on whether they attributed a high or a medium/low impact to the project, a split which consistently related to longitudinal two-year changes in the R/D ratio used as the proximate outcome. Using this indicator instead of grouping employees into participants/non-participants might address an issue of misclassification, as participation alone does not assure a positive impact: organizational-level SMI triggers changes in groups, from which non-participants also potentially benefit.

As regards the practical implementation of SMI, this study showed that organizational-level SMI requires considerable perseverance to develop awareness and change in the broader workforce, with a healthy profile on average, through surveys, empowerment courses and participatory team workshops. Although short-term activities can reach narrowly defined risk groups, the development of sustainable health-promoting organizational structures, strategies and cultures requires a broadened time frame as well as a focus on both job demands and resources. This investment can be optimized by reducing the scope and frequency of surveys, developing a readiness for change and coherent change patterns by involving managers and employees in the course planning, and integrating training, working groups and discussion forums into the daily (team) work. This integration and involvement in the intervention design could enhance outcome expectancies through a better perceived fit between the project and the organizational structure, strategy and culture, especially in sectors such as healthcare and manufacturing with less flexible working schedules. Finally, such a continuous health-oriented optimization process should be equipped with tools for long- and short-term observation, as well as to support reflection and action relating to job resources, demands and health.

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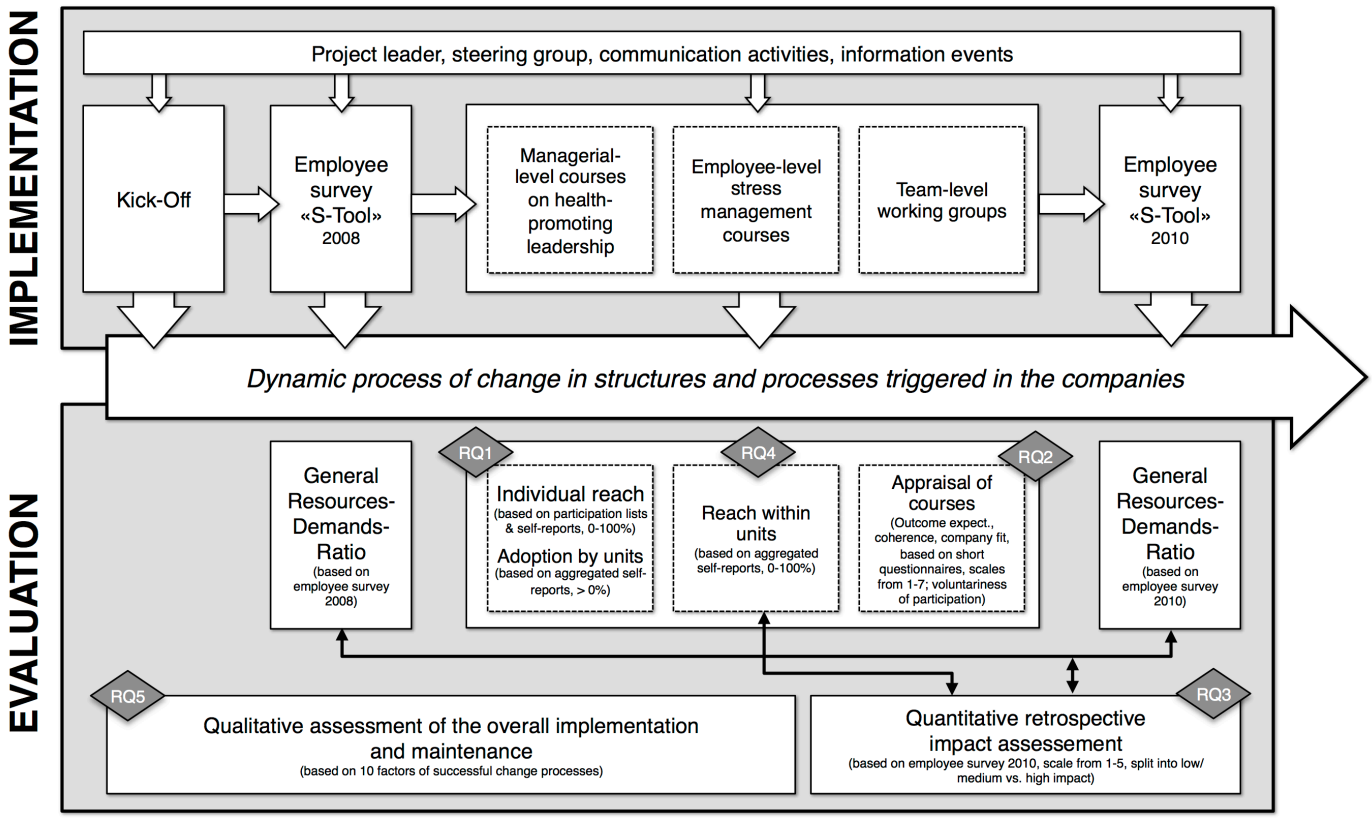
Figure Captions

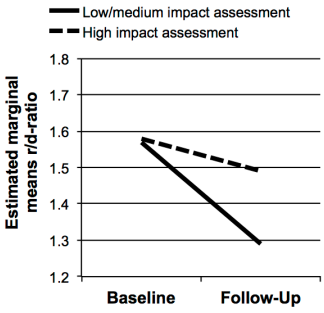
Figure 1: Illustration of the implementation steps aligned with the evaluation methods and research questions (RQ).

Figure 2: Change in R/D-ratio (estimated marginal means) separated for baseline-level R/D ratios for employees/managers

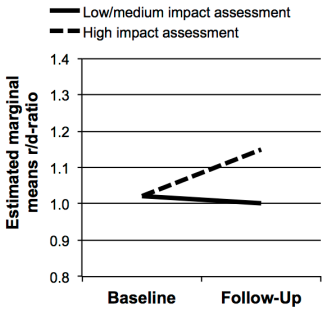
Figure 3: Reach of intervention elements within company units (incl. standard deviation) for units with low and high mean levels of retrospective impact assessment


IMPLEMENTATION
Project leader, steering group, communication activities, information events
Kick-Off
Employee survey «S-Tool» 2008
Managerial-level courses on health-promoting leadership
Employee-level stress management courses
Team-level working groups
Employee survey «S-Tool» 2010
Dynamic process of change in structures and processes triggered in the companies
EVALUATION
General Resources-Demands-Ratio (based on employee survey 2008)
RQ1
Individual reach (based on participation lists & self-reports, 0-100%)
Adoption by units (based on aggregated self-reports, > 0%)
RQ4
Reach within units (based on aggregated self-reports, 0-100%)
RQ2
Appraisal of courses (Outcome expect., coherence, company fit, based on short questionnaires, scales from 1-7; voluntariness of participation)
General Resources-Demands-Ratio (based on employee survey 2010)
RQ5
Qualitative assessment of the overall implementation and maintenance (based on 10 factors of successful change processes)
RQ3
Quantitative retrospective impact assessement (based on employee survey 2010, scale from 1-5, split into low/ medium vs. high impact)

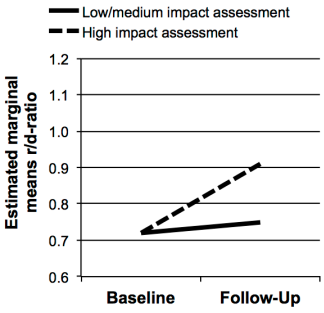
Employees



(1) Very favorable R/D ratio at baseline

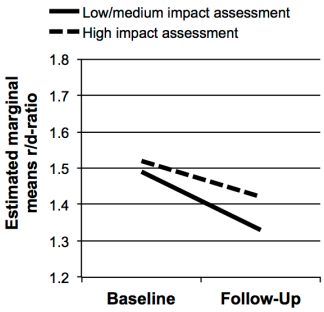


(2) Favorable R/D ratio at baseline

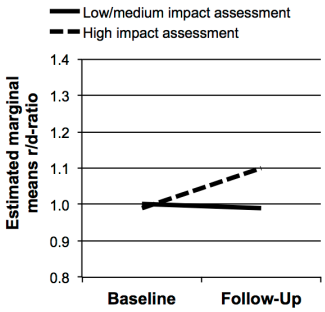


(3) Unfavorable R/D ratio at baseline

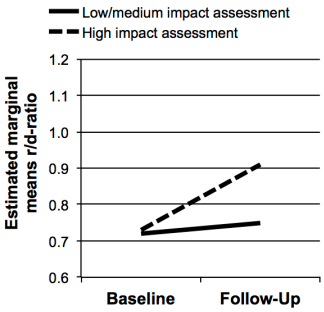
Managers



(4) Very favorable R/D ratio at baseline

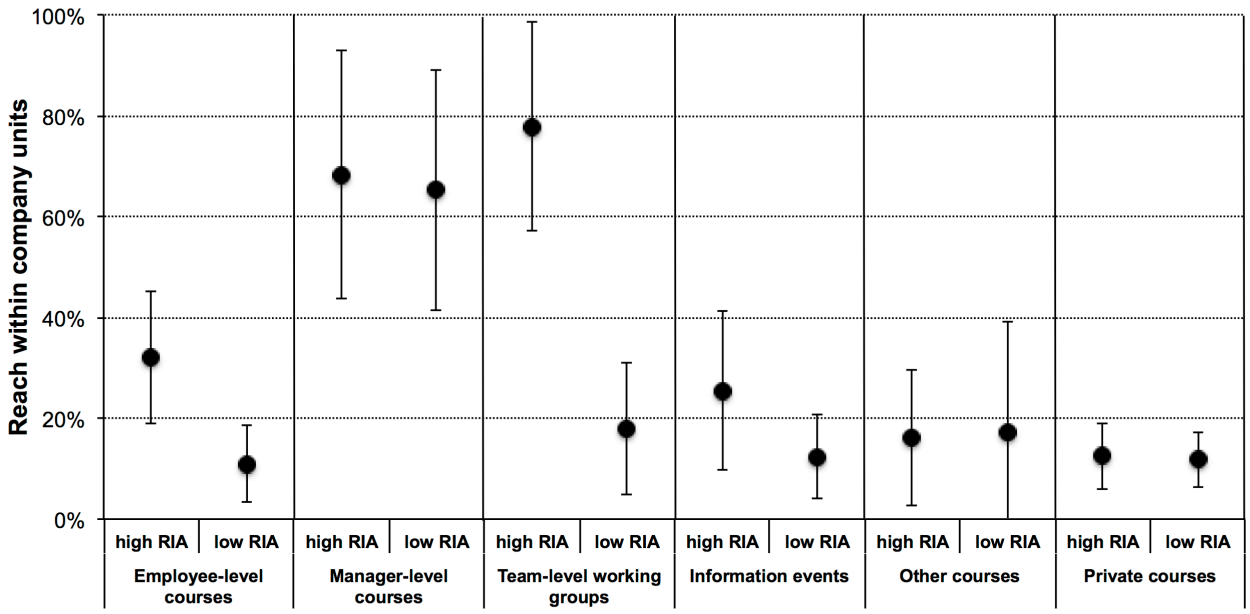


(5) Favorable R/D ratio at baseline



(6) Unfavorable R/D ratio at baseline

Note. Covariates included: demands, resources and age at baseline measurement



Reach of intervention elements within company units for units with high and low mean levels of retrospective impact assessment (RIA)

Note. Mean levels of retrospective impact assessment (RIA) were computed for all 58 company units; for selection and grouping into high and low RIA-units, +/- 1 SD was chosen. Item formulation of RIA: Have the project activities made a positive impact on the company?, Have the project activities made a positive impact on you personally?, Has the project changed your way of dealing with stress?, Has the project encouraged you to talk more often about stress in your work environment than before?, Has the project changed the behavior of your superiors?; rated on a seven-point Likert scale from "Not at all" to "Yes, very much so".